

Serial No. 09/515,348

Remarks

The various parts of the Office Action (and other matters, if any) are discussed below under appropriate headings.

Entry of Reply

It is believed that the reply raises no new issues, does not require an additional search and/or places the application in a better condition for allowance and/or appeal.

Specifically, previously dependent claim 25 has been rewritten in independent form including the limitations of now cancelled claim 1. Accordingly, entry of the reply is considered proper.

Claim Rejections - 35 USC § 103

Claim 25 recites a method of analyzing a mask manufacturing process that includes simulating lithographic processing using data received from or derived from imaging of a portion of a mask and mask design data, thereby obtaining first and second simulated wafer structures. The first and second simulated wafer structures are compared to each other and to an ideal wafer structure. Critical dimension variations across the wafer structure are evaluated based on the comparing steps.

The claimed invention compares first and second simulated wafer structures to each other and to an ideal wafer structure, and evaluates the critical dimension variations across the wafer structure to analyze the effect that a particular mask making process has on a wafer structure formation process.

Neither Chang nor Pierrat, taken alone or in combination, discloses or fairly suggests comparing first and second simulated wafer structures (corresponding to mask image data and mask design data, respectively) to each other and to an ideal wafer structure. The deficiencies of these primary references are not cured by Fiekowsky or Sheng.

The latter portion of paragraph 4, page 6 of the Office Action asserts that "Chang anticipates comparing the two simulated wafer structures to an ideal wafer structure (figure 20, mask image simulation 2020 and design data simulation 2050 are displayed, their difference is displayed at 2030, and the original design data is displayed at 2040." As understood, the Office Action asserts that the "original design data" discussed in col. 26 of Chang is equivalent to the claimed ideal wafer structure. It is respectfully submitted that a closer reading of Chang reveals that this interpretation of Chang is incorrect.

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At col. 26, lines 49-51, Chang states that "[w]indow 2040 illustrates the original design layout of the captured mask image of window 2010." (Emphasis added). Chang further discloses that "[w]indow 2050 illustrates the simulated wafer exposure of the original design layout of window 2040." In other words, Chang is understood to disclose that window 2040 corresponds to the mask design data and window 2050 corresponds to a simulation of the mask design data, which is compared to window 2020 (simulation of the captured microscope image of a portion of the mask). While this disclosure may suggest comparison of two simulations (corresponding to mask image data and mask design data, respectively), this portion of Chang does not disclose or fairly suggest comparing the two aforementioned simulations to an ideal wafer structure, as is recited in claim 25.

Also, it is generally understood in the art that "original design layout of the captured mask image" (i.e., mask design data) is not equivalent to an "ideal wafer structure." For example, mask design data generally would include optical proximity correction (OPC) modifications, while an ideal wafer structure (or data corresponding thereto) would not include such OPC modifications.

Further, neither Chang nor Pierrat, taken alone or in combination with Fiekowsky and/or Sheng, disclose or fairly suggest analyzing a mask manufacturing process by evaluating critical dimension variations across a wafer structure. Rather, Chang and Pierrat are concerned with inspecting photomasks to locate specific or localized defects on the mask. While Fiekowsky deals with feature measurement, it contains no suggestion to analyze a mask manufacturing process by evaluating critical dimension variations across a wafer structure.

For at least these reasons, it is respectfully submitted that claim 25 and claims 5-20, 24 and 26 dependent therefrom distinguish patentably over the references of record. Accordingly, the rejections should be withdrawn.

Telephone Interview

In the interests of advancing this application to issue and compact prosecution, it is respectfully requested that the Examiner telephone the undersigned to discuss any of the foregoing with which there may be some controversy or confusion or to make any suggestions that the Examiner may have to place the application in condition for allowance.

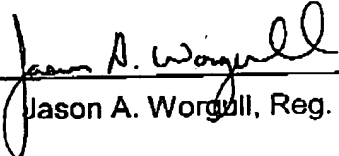
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Conclusion

In view of the foregoing, request is made for timely issuance of a notice of allowance.

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR, LLP

By 
Jason A. Worgull, Reg. No. 48,044

1621 Euclid Avenue
Nineteenth Floor
Cleveland, Ohio 44115
(216) 621-1113

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